



A.D, 1855 N^o 1307.

S P E C I F I C A T I O N

OF

RICHARD ANSTEY TUCKER.

FURNACES AND OTHER FIRE-PLACES.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

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25, SOUTHAMPTON BUILDINGS, HOLBORN.

1855.



A.D. 1855 N° 1307.

Furnaces and other Fire-places.

LETTERS PATENT to Richard Anstey Tucker, of Lenton, in the County of Nottingham, Starch Manufacturer, for the Invention of “**USING THE GAS AND SMOKE ARISING FROM COAL OR OTHER SUBSTANCES DURING THE PROCESS OF COMBUSTION FOR FUEL.**”

Sealed the 17th August 1855, and dated the 7th June 1855.

PROVISIONAL SPECIFICATION left by the said Richard Anstey Tucker at the Office of the Commissioners of Patents, with his Petition, on the 7th June 1855.

I, RICHARD ANSTEY TUCKER, of Lenton, in the County of Nottingham,
5 Starch Manufacturer, do hereby declare the nature of the said Invention for
“**USING THE GAS AND SMOKE ARISING FROM COAL OR OTHER SUBSTANCES DURING THE
PROCESS OF COMBUSTION FOR FUEL**” to be as follows:—

My Invention consists in the mode or manner of using the smoke and gas
arising from coal in the process of combustion for fuel in furnaces prior to
10 their reaching the flame wall at the back of the fire-place. This my Inven-
tion may be applied to steam boilers, brick kilns, or any place where intense
heat is required.

In order to shew the nature of my Invention, and the manner of performing

Tucker's Method of Using Gas & Smoke arising from Coal, &c. during Combustion.

the same, I propose to take an ordinary fire-place under a boiler or in any suitable place, which I divide in the centre with a fire-brick wall or other material, the centre wall to touch the flame wall at the back thereof, and to come up to the dead plate in front, leaving sufficient space between the front of the partition wall and the fire door. The top of the wall must touch the 5 boiler or other part intended to be heated, so that there shall be two distinct fire-places in one furnace.

I place a valve, which can be moved by any simple contrivance, at the back of the flame wall, so that either aperture or outlet for the fire into the flue can be stopped at pleasure. I then light a fire of coke in one of the com- 10 partments; the outlet into the flue of that one being open and the other outlet closed, cover the empty fire bars in the compartment the valve of which is closed with coals, to prevent the air drawing in too much until the coke fire is well burnt through, then clear out the coals and light a coal fire in the cold fire-place, keeping the valve closed until all the smoke, gas, &c. are emitted, 15 which will be drawn round the wall, pass between it and the fire door over the red-hot coke fire, and will be found to ignite and give out heat sufficient for all usual purposes. When the coke fire has burned so as to require fresh fuel, use coal, then close the aperture, remove the valve that was closed, so that the draught shall be reversed. 20

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Richard Anstey Tucker in the Great Seal Patent Office on the 7th December 1855.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, RICHARD ANSTEY TUCKER, of Lenton, in the County of Nottingham, Starch Manufac- 25 turer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Seventh day of June, in the year of our Lord One thousand eight hundred and fifty-five, in the eighteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said 30 Richard Anstey Tucker, Her special licence that I, the said Richard Anstey Tucker, my executors, administrators, and assigns, or such others as I, the said Richard Anstey Tucker, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times

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thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for “**USING THE GAS AND SMOKE ARISING FROM COAL OR OTHER SUBSTANCES DURING THE PROCESS OF**
5 **COMBUSTION FOR FUEL,**” upon the condition (amongst others) that I, the said Richard Anstey Tucker, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and
10 immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Richard Anstey Tucker, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto
15 annexed, that is to say:—

My Invention consists in the mode or manner of using the smoke and gas arising from coal or other substances during the process of combustion for fuel in furnaces, &c. prior to their reaching the flame wall at the back of the fire-place. My Invention may be applied to steam boilers, brick kilns, or any
20 place where considerable heat is required.

In order to shew the nature of my Invention, and the manner of performing the same, I propose to describe the Invention as applied to an ordinary fire-place under a boiler, or in any suitable place. I divide the fire place in the centre with a wall of fire brick or other material; the centre wall is made to
25 touch the flame wall at the back thereof, and to come up to the dead plate in front, leaving sufficient space between the front of the partition wall and the fire door. The top of the wall must touch the boiler, or other part intended to be heated, so that there shall be two distinct fire-places in one furnace.

30 I place a valve, which can be moved by any simple contrivance, at the back of the flame wall, so that either aperture or outlet for the fire into the flue can be stopped at pleasure. Suppose a fire of coke to be now lighted in one of the compartments, the outlet into the flue of that one being open and the other outlet closed, I then cover the empty fire bars in the compartment the
35 valve of which is closed with coals, to prevent the air drawing in too much until the coke fire is well burnt through, then clear out the coals and light a coal fire in the cold fire-place, keeping the valve closed until all the smoke, gas, &c. are emitted, which will be drawn round the wall, pass between it and

Tucker's Method of Using Gas & Smoke arising from Coal, &c. during Combustion.

the fire door over the red-hot coke fire, and will be found to ignite and give out heat sufficient for all usual purposes. When the coke fire has burned so as to require fresh fuel, I use coal, then close the aperture and remove the valve that was closed, so that the draught will be reversed.

Figures 1, 2, and 3 of the annexed Drawings represent my Invention as applied to the furnace of a stationary steam engine boiler. Figure 1 represents a sectional side view; Figure 2, an end view without the furnace door; and Figure 3, a sectional plan. They are all drawn to a scale of one inch to a foot. Similar letters indicate similar parts; the parts tinted are in section. *a* represents the front of the furnace, the casting being enlarged at *b* to form a bearing for the rod *c*; *d* is a plate of iron or fire brick, having holes through it, which are stopped up with small plugs *e, e*. This plate extends from the mouth of the furnace to the front cross bar, which supports one end of the fire bars *f*. *g* is a plate or fire brick wall, the length of the fire bars and cross bars reaching from the fire bars to the top of the furnace; *h* is another plate or wall, extending along the width of the furnace, and reaching from a little above the fire bars to the bottom of the furnace; *i* is a plate, bent at right angles, and free to move to the right or left on the pins *k*. The plate or wall *g* divides the furnace into two parts; one of which is closed by half the plate *i*, the other being left open; the plate *i* being moved by a piece keyed on one end of the rod *c*, a winch handle being on the other end in front of the furnace. The working of the Invention is as follows:—The fire in the furnace being burnt up and requiring fresh fuel, the handle of the rod *c* is placed as shewn in Figure 2, thereby shutting off the draft of half the furnace leading to the chimney; fresh fuel is put upon the half of the fire, having the draft cut off (the door being closed); the gas and smoke arising therefrom will pass round the front end of the plate or wall *g*, and being mixed with a sufficient quantity of atmospheric air admitted through the plate *d* (a number of the plugs *e* being taken out for that purpose), will pass over the fire in the other half of the furnace, and be consumed in flame without giving off any smoke. When the fuel last put on is burnt well through, the handle of the rod *c* is turned to the other side of the furnace, causing the plate *i* to close on to the half of the furnace, and cut off the draught in the compartment that was open, and open that in the closed compartment; the closed half being fed with fresh fuel, the process is continued.

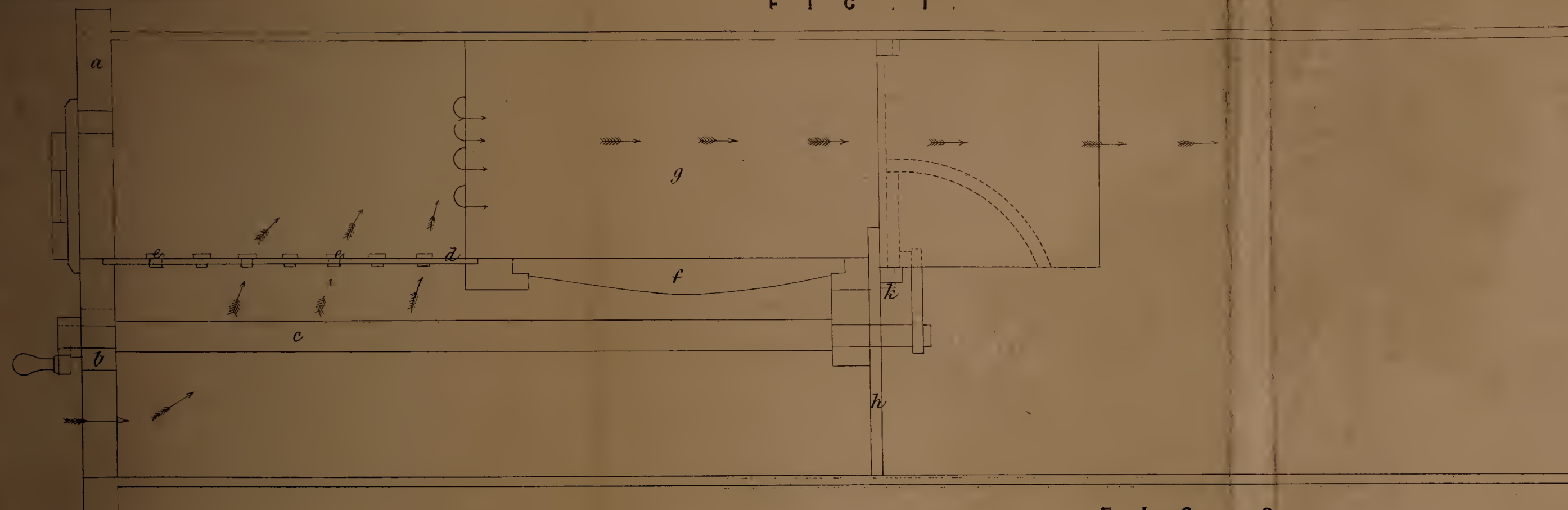
And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that I do not claim passing the smoke of one fire over another, as I am aware of that having been done

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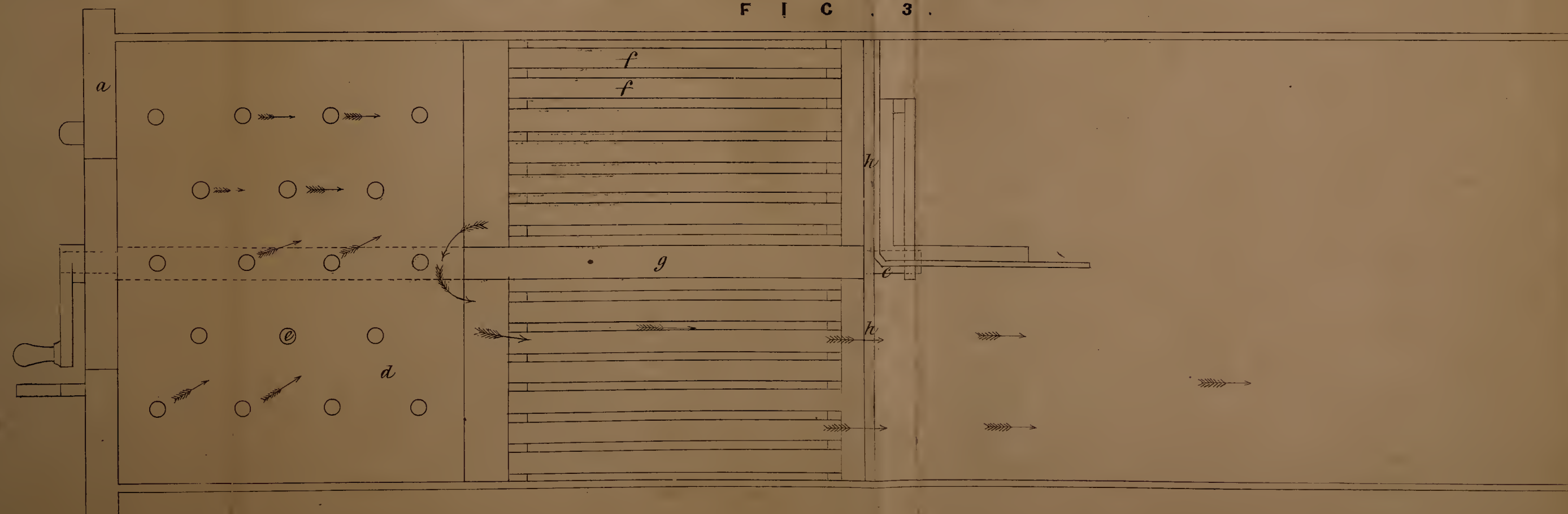
TUCKER'S SPECIFICATION.

(1 SHEET.)

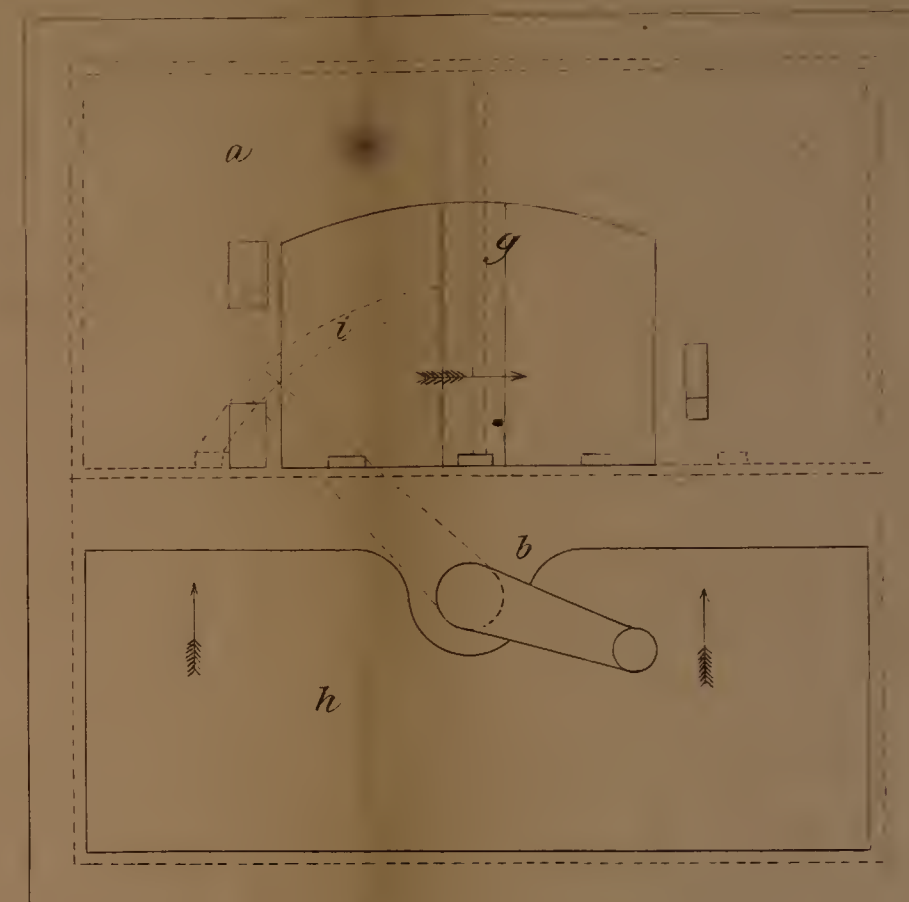
F I G . 1 .



F I G . 3 .



F I G . 2 .



The filed drawing is partly colored.

Drawn on Stone by Malby & Sons

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before ; but I do claim as of my Invention, the method herein-before described of employing the gas and smoke arising from the combustion of fuel and intermingling air therewith, thereby making it into fuel suitable for all heating
5 purposes, and also using the same as herein set forth ; I do not, however, confine myself to the use of any part or parts of the above apparatus, but add or substitute others as convenience may suggest or require.

In witness whereof, I, the said Richard Anstey Tucker, have hereunto
set my hand and seal, this Fifth day of December, One thousand
10 eight hundred and fifty-five.

RICHARD A. TUCKER. (L.S.)

Witness,

GEO. JON. ROBINSON,

Patent Agent,

15 Nottingham.

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Printers to the Queen's most Excellent Majesty. 1855.

